LISTING OF THE CLAIMS

1. (currently amended) A system for building an engine baseline model for fuel-powered engines, comprising:

a computer comprising:

a processor;

a memory configured to store a program of instructions;

an engine service database containing engine data for fuel-powered engines;

~~a preprocessor for processing the engine data into a predetermined format, wherein the preprocessor includes~~ a data segmenting component that segments the engine data into a plurality of groups, and each group clusters a portion of the engine data based on similarities in engine operating parameters, based on each specific engine, and based on time periods of data acquisition ~~based upon specific types of engines and further based upon specific time periods during which each data element was measured~~; and

an engine baseline modeling component that builds an engine baseline model for each of the plurality of groups using regression analysis, wherein the regression analysis relates engine performance variables as functions of the engine operating parameters; and

a display configured to display at least one aspect of the engine baseline model.

2. (previously presented)The system of claim 1, wherein the data segmenting component segments the engine data into the plurality of groups throughout a preselected moving time window.

3. (previously presented)The system of claim 1, wherein the data segmenting component segments the engine data into the plurality of groups throughout discrete time ranges.

4. (previously presented)The system of claim 1, wherein the engine baseline modeling component generates a set of estimated regression parameters for each of the plurality

of groups based upon the regression analysis, wherein each set of estimated regression parameters are representative of a baseline model for that group.

5. (original) The system of claim 4, wherein the engine baseline modeling component calculates a time series for each estimated regression parameter, and wherein the engine baseline modeling component further calculates a trend for each estimated regression parameter over time.

6. (previously presented)The system of claim 4, further comprising:

means for identifying fluctuations in trends for each estimated regression parameter representative of engine faults;

means for evaluating trends having identified fluctuations; and

means for identifying parameters estimating trends relating to baseline trend shifts.

7. (original) The system of claim 6, wherein the preprocessor maps engine data to an uncorrelated data set using a principal component analysis technique.

8. (previously presented)The system of claim 1, wherein the preprocessor comprises a data acquisition component that extracts engine data from the engine services database.

9. (original) The system of claim 1, wherein the engine baseline modeling component comprises a metric component that validates the engine baseline model.

10. (original) The system of claim 1, wherein the engine baseline modeling component comprises a heuristics component that generates rules for cleaning the preprocessed data.

11. (original) The system of claim 1, further comprising a model diagnostics component that evaluates performance of the engine baseline model.

12. (currently amended) A computer implemented method for building an engine baseline model for fuel-powered engines, comprising:

storing engine data in an engine service database for fuel-powered engines;

processing the engine data into a predetermined format in a preprocessor, wherein the processing includes segmenting the engine data into a plurality of groups based upon similarities in engine operating parameters, based on each specific ~~types of~~ engine[[s]], and further based upon specific time periods during which each data element was measured;

building an engine baseline model for each of the plurality of groups using ~~a~~ regression analysis, wherein the regression analysis relates engine performance variables as functions of the engine operating conditions;

using the engine baseline model to monitor engine status, predict future engine behavior, diagnose engine faults, identify when engine performance is out of specification, identify engine quality, or design a new engine system, or a combination thereof.

13. (previously presented)The method of claim 12, further comprising segmenting the engine data into the plurality of groups throughout a preselected moving time window.

14. (previously presented)The method of claim 12, further comprising segmenting the engine data into the plurality of groups throughout discrete time ranges.

15. (previously presented)The method of claim 12, further comprising generating a set of estimated regression parameters for each of the plurality of groups based upon the regression analysis, wherein each set of estimated regression parameters are representative of a baseline model for that group.

16. (original) The method of claim 15, further comprising:

calculating a time series for each estimated regression parameter; and

calculating a trend for each estimated regression parameter over time.

17. (previously presented)The method of claim 15, further comprising:

identifying fluctuations in trends for each estimated regression parameter representative of engine faults;

evaluating trends having identified fluctuations; and

identifying parameters estimating trends relating to baseline trend shifts.

18. (original) The method of claim 17, further comprising mapping engine data to an uncorrelated data set using a principal component analysis technique.

19. (original) The method of claim 12, wherein the processing step further comprising extracting engine data from the engine services database.

20. (original) The method of claim 12, further comprising validating the engine baseline model.

21. (original) The method of claim 12, further comprising generating rules for cleaning the preprocessed data.

22. (original) The method of claim 12, further comprising evaluating performance of the engine baseline model.

23. (currently amended) A computer-readable storage medium incorporating computer instructions, which when executed on a computer perform a process for building an engine baseline model for fuel-powered engines, comprising:

instructions for storing engine data in an engine service database for fuel-powered engines;

instructions for processing the engine data into a predetermined format in a preprocessor, wherein the instructions for processing include instructions for segmenting the engine data into a plurality of groups based upon similar engine operating parameters ~~specific types of engines~~ and further based upon specific time periods during which each data element was measured;

instructions for building an engine baseline model for each of the plurality of groups using regression analysis, wherein the regression analysis relates engine performance variables as functions of the engine operating parameters;

instructions for using the engine baseline model to monitor engine status, predict future engine behavior, diagnose engine faults, identify when engine performance is out of specification, identify engine quality, or design a new engine system, or a combination thereof.

24. (previously presented)The computer-readable medium of claim 23, further comprising instructions for segmenting the engine data into the plurality of groups throughout a preselected moving time window.

25. (previously presented)The computer-readable medium of claim 23, further comprising instructions for segmenting the engine data into the plurality of groups throughout discrete time ranges.

26. (previously presented)The computer-readable medium of claim 23, further comprising instructions for generating a set of estimated regression parameters for each of the plurality of groups based upon the regression analysis, wherein each set of estimated regression parameters are representative of a baseline model for that group.

27. (previously presented)The computer-readable medium of claim 25, further comprising:

instructions for calculating a time series for each estimated regression parameter; and

instructions for calculating a trend for each estimated regression parameter over time.

28. (previously presented)The computer-readable medium of claim 26, further comprising:

instructions for identifying fluctuations in trends for each estimated regression parameter representative of engine faults;

instructions for evaluating trends having identified fluctuations; and

instructions for identifying parameters estimating trends relating to baseline trend shifts.

29. (previously presented)The computer-readable medium of claim 28, further comprising instructions for mapping engine data to an uncorrelated data set using a principal component analysis technique.

30. (previously presented)The computer-readable medium of claim 23, wherein the instructions for processing further comprise one or more instructions for extracting engine data from the engine services database.

31. (previously presented)The computer-readable medium of claim 23, further comprising instructions for validating the engine baseline model.

32. (previously presented)The computer-readable medium of claim 23, further comprising instructions for generating rules for cleaning the preprocessed data.

33. (previously presented)The computer-readable medium of claim 23, further comprising instructions for evaluating performance of the engine baseline model.

34. (currently amended) A computer implemented method for building an engine baseline model for combustion-based engines, comprising:

storing engine data in an engine service database for combustion-based engines;

~~processing the engine data into a predetermined format in a preprocessor, wherein the processing includes segmenting~~ clustering the engine data into a plurality of groups ~~each based~~ on similarities in engine operating conditions, based on each specific engine, and based on time periods of data acquisition~~based upon specific types of engines and further based upon specific time periods during which each data element was measured~~;

building an engine baseline model for each of the plurality of groups using regression analysis, wherein the regression analysis relates engine performance variables as functions of the engine operating conditions; and

outputting at least one aspect of the engine baseline model for display on a monitor.

35. (currently amended) A computer-readable storage medium incorporating computer instructions, which when executed on a computer perform a process for building an engine baseline model for combustion-based engines, comprising:

instructions for storing engine data in an engine service database for combustion-based engines;

~~instructions for processing the engine data into a predetermined format in a preprocessor, wherein the instructions for processing include instructions for~~ segmenting the engine data into a plurality of groups representative of different clusters of similar engine operating parameters comprising altitude, air speed, air temperature, fuel specific heat value, air humidity, control settings, or a combination thereof ~~based upon specific types of engines and further based upon specific time periods during which each data element was measured~~;

instructions for building an engine baseline model for each of the plurality of groups using regression analysis, wherein the regression analysis relates engine performance variables as functions of the engine operating parameters; and

instructions for outputting at least one aspect of the engine baseline model for display on a monitor.

36. (new) The system of claim 1, wherein the engine service database comprises historical service information.

37. (new) The system of claim 1, wherein the plurality of groups comprise a plurality of different engine performance variables.

38. (new) The method of claim 12, wherein the engine service database comprises engine repair history.

39. (new) The system of claim 1, wherein the each group represents a cluster of similar engine operating parameters comprising altitude, air speed, air temperature, fuel specific heat value, air humidity, control settings, or a combination thereof.

40. (new) The system of claim 12, wherein the plurality of groups are representative of different clusters of similar engine operating parameters comprising altitude, air speed, air temperature, fuel specific heat value, air humidity, control settings, or a combination thereof.

41. (new) The method of claim 23, wherein the plurality of groups are representative of different clusters of similar engine operating parameters comprising altitude, air speed, air temperature, fuel specific heat value, air humidity, control settings, or a combination thereof.